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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,426	11/08/2001	Brad R. Lewis	30014200-1006	6022

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EXAMINER	
SHRADER, LAWRENCE J	
ART UNIT	PAPER NUMBER
2124	

DATE MAILED: 09/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,426	LEWIS ET AL.	
	Examiner	Art Unit	
	Lawrence Shrader	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/08/2001; 3/19/2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings received on 3/19/2002 are acknowledged.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Apparently the second set of method claims on page 62, line 6 of the specification should begin with the number 8 rather than repeating number 6 ff. Accordingly, claims 6 (the second claim 6) through 26 should be renumbered 8 through 28.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 – 7; 8 – 13, 15; 16 – 22; 23 – 27; and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Santhanam, U.S. Patent 6,286,135 in view of Hamada et al., U.S. Patent 6,493,863 (hereinafter referred to as Hamada).

In regard to claim 1:

A method in a data processing system for developing a data flow program comprising code segments distributed between blocks of memory, the method comprising the steps of:

generating a graph that represents the data flow program, the graph comprising nodes corresponding to selected ones of the blocks and arcs corresponding to dependency relationships between the nodes; and

receiving an optimization command to manipulate the graph to improve performance of the data flow program.

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks (column 4, lines 10 – 65).

In regard to claim 2, incorporating the rejection of claim 1:

"...further comprising the step of performing the optimization command."

See Santhanam column 4, lines 10 – 14.

In regard to claim 3, incorporating the rejection of claim 2:

"...further comprising the step of performing performance analysis on the data flow program in accordance with the optimization command."

See Santhanam at column 2, lines 3 – 7 for a performance analysis on a data flow program.

In regard to claim 4, incorporating the rejection of claim 1:

"...wherein the nodes are placed in an execution queue for processing, and wherein the optimization command specifies re-ordering the nodes in the execution queue."

Santhanam discloses a reordering of instructions for execution efficiency (column 4, line 66 to column 5, line 3).

In regard to claim 5, incorporating the rejection of claim 1:

"...wherein the nodes are characterized by node execution times, and wherein the optimization command specifies setting one of the node execution times, and further comprising the step of simulating execution of the data flow program in accordance with the node execution times."

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, but does not explicitly disclose nodes characterized by execution times and simulating the data flow program in accordance with the node execution times. However, Hamada discloses application program modules represented in a data flow graph that are simulated and determining the execution timing of each of the modules in a second data flow graph (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Santhanam with the simulation and determination of node (module) execution times as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

In regard to claim 6, incorporating the rejection of claim 1:

"...wherein the blocks are assigned data operated on by the data flow program and wherein the optimization command specifies setting revised data for a selected block."

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, but does not explicitly disclose data assigned to blocks and operated on by the data flow diagram. However, Hamada discloses application program modules, represented in a data flow graph, that are simulated and data is changed repeatedly to achieve optimal threshold values (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Santhanam with the simulation and determination of node (module) data values as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

In regard to claim 7, incorporating the rejection of claim 1:

> *"...wherein the optimization command specifies a performance comparison between selected nodes."*

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, but does not explicitly disclose performance comparison between blocks. However, Hamada discloses application program modules, represented in a data flow graph, that are simulated and data is changed repeatedly to achieve optimal threshold values to optimize performance between blocks (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Santhanam with the simulation and determination of node (module) data values as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

In regard to claim 8:

A method in a data processing system for developing a data flow program comprising code segments that operate on data in memory, the method comprising the steps of:

"dividing a memory area into blocks and associating each block with at least a portion of the data and with at least one code segment;"

For example, see Santhanam Figures 18 – 26.

"generating a graph representation of the data flow program, the graph representation comprising nodes associated with the blocks, and arcs associated with dependencies between the blocks; and

performing an optimization command to manipulate the graph to improve performance of the data flow program."

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks (column 4, lines 10 – 65).

In regard to claim 9, incorporating the rejection of claim 8:

"...further comprising the step of performing performance analysis on the data flow program."

See Santhanam at column 2, lines 3 – 7 for a performance analysis on a data flow program.

In regard to claim 10, incorporating the rejection of claim 8:

"...further comprising the step of entering the nodes a queue for execution, and wherein the optimization command specifies reordering the nodes in the queue."

Santhanam discloses a reordering of instructions for execution efficiency (column 4, line 66 to column 5, line 3).

In regard to claim 11, incorporating the rejection of claim 9:

> *"...wherein the step of performing performance analysis comprises the step of determining execution time for the data flow program."*

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, but does not explicitly disclose nodes characterized by execution times and simulating the data flow program in accordance with the node execution times. However, Hamada discloses application program modules represented in a data flow graph that are simulated and determining the execution timing of each of the modules in a second data flow graph (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Santhanam with the simulation and determination of node (module) execution times as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

In regard to claim 12, incorporating the rejection of claim 9:

> *"...wherein the step of performing performance analysis comprises the step of simulating execution of the nodes in the graph."*

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, but does not explicitly disclose nodes characterized by execution times and simulating the data flow program in accordance with the node execution times. However, Hamada discloses application program modules represented in a data flow graph that are simulated and determining the execution timing of each of the modules in a second data flow graph (column 2, lines 19 – 45). Therefore,

it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Santhanam with the simulation and determination of node (module) execution times as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

In regard to claim 13, incorporating the rejection of claim 9:

> *"...wherein the nodes are characterized by node execution times, and wherein the optimization command specifies a reduced node execution time for one of the nodes, and wherein the step of performing performance analysis comprises the step of determining execution time for the data flow program in accordance with the reduced node execution time."*

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, but does not explicitly disclose nodes characterized by execution times and simulating the data flow program in accordance with the node execution times. However, Hamada discloses application program modules represented in a data flow graph that are simulated and determining the execution timing of each of the modules in a second data flow graph (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Santhanam with the simulation and determination of node (module) execution times as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

In regard to claim 15, incorporating the rejection of claim 8:

"...wherein the optimization command specifies a modification to at least a portion of the data."

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, but does not explicitly disclose data assigned to blocks and operated on by the data flow diagram. However, Hamada discloses application program modules, represented in a data flow graph, that are simulated and data is changed repeatedly to achieve optimal threshold values (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the graph as taught by Santhanam with the simulation and determination of node (module) data values as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

In regard to claim 16 (a computer-readable medium): It is rejected for the same corresponding reasons put forth in the rejection of claim 6a (a corresponding method).

In regard to claim 17 (a computer-readable medium), incorporating the rejection of claim 16: It is rejected for the same corresponding reasons put forth in the rejection of claim 9 (a corresponding method).

In regard to claim 18 (a computer-readable medium), incorporating the rejection of claim 16: It is rejected for the same corresponding reasons put forth in the rejection of claim 10 (a corresponding method).

In regard to claim 19 (a computer-readable medium), incorporating the rejection of claim 17: It is rejected for the same corresponding reasons put forth in the rejection of claim 11 (a corresponding method).

In regard to claim 20 (a computer-readable medium), incorporating the rejection of claim 17: It is rejected for the same corresponding reasons put forth in the rejection of claim 12 (a corresponding method).

In regard to claim 21 (a computer-readable medium), incorporating the rejection of claim 17: It is rejected for the same corresponding reasons put forth in the rejection of claim 13 (a corresponding method).

In regard to claim 22 (a computer-readable medium), incorporating the rejection of claim 16: It is rejected for the same corresponding reasons put forth in the rejection of claim 15 (a corresponding method).

In regard to claim 23 (a system): It is rejected for the same corresponding reasons put forth in the rejection of claim 1 (a corresponding method).

In regard to claim 24 (a system), incorporating the rejection of claim 23: It is rejected for the same corresponding reasons put forth in the rejection of claim 4 (a corresponding method).

In regard to claim 25 (a system), incorporating the rejection of claim 23: It is rejected for the same corresponding reasons put forth in the rejection of claim 5 (a corresponding method).

In regard to claim 26 (a system), incorporating the rejection of claim 23: It is rejected for the same corresponding reasons put forth in the rejection of claim 7 (a corresponding method).

In regard to claim 27 (a system), incorporating the rejection of claim 23: It is rejected for the same corresponding reasons put forth in the rejection of claim 6 (a corresponding method).

In regard to claim 28 (a system): It is rejected for the same corresponding reasons put forth in the rejection of claims 1 and 8 (corresponding methods).

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Santhanam, U.S. Patent 6,286,135 in view of Hamada et al., U.S. Patent 6,493,863, and further in view of Kahn et al., U.S. Patent 6,662,278 (hereinafter referred to as Kahn).

In regard to claim 14, incorporating the rejection of claim 9:

> *"...wherein the optimization command specifies a memory bandwidth, and wherein the step of performing performance analysis comprises the step of determining execution time for the data flow program in accordance with the memory bandwidth."*

Santhanam discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, and Hamada discloses application program modules represented in a data flow graph that are simulated and determining the execution timing of each of the modules in a second data flow graph, but neither explicitly discloses memory bandwidth specification. However, Kahn discloses a memory bandwidth specification for available memory access (Abstract). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Santhanam with the simulation and determination of node (module) execution times as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value, and further modified with the a threshold placed on memory bandwidth as

taught by Kahn, because the further modification enhances the code depicted in the data graph of Santhanam with a threshold of memory accesses per unit of time, as taught by Kahn at column 2, lines 54 – 57, further increasing the efficiency of the optimized code.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Shrader whose telephone number is (703) 305-8046. The examiner can normally be reached on M-F 08:00-16:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence Shrader
Examiner
Art Unit 2124

3 September 2004

KAKALI CHAKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100